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ABSTRACT

This paper describes a case study/client scenario approach used in an advanced medical/surgical nursing course; its methods of interactive learning are facilitated by the computer technology available in a "master classroom." This approach incorporates concepts of adult learning theory and creativity and group interaction. The equipment, such as an instructor multimedia computer, student computer stations, networking capabilities and a ceiling-mounted multi-source projector, is key to the implementation of the case study/client scenario approach. Four examples are provided that demonstrate variations of the case study/client scenario approach. Benefits of technology use in a case study approach to learning are discussed, including: (1) active learning and student interaction; (2) critical thinking; (3) an extension of available clinical situations; (4) practical experience in computer use and group presentation; and (5) facilitation of group interaction. Appendices offer excerpts from case information for the four examples. (Author/AEF)

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Running head: MASTER CLASSROOM TECHNOLOGY

Use of Master Classroom Technology to Implement a Case Study Approach to Learning

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Abstract

The availability of instructional technology can allow for more innovative teaching strategies in the classroom. This paper describes a case study/client scenario approach used in an advanced medical/surgical nursing course as an example of interactive learning that can be facilitated by the computer technology available in a "master classroom". This approach incorporates concepts of adult learning theory and experiential learning in case studies providing opportunities for critical thinking, creativity, and group interaction. The equipment such as a instructor multimedia computer, student computer stations, networking capabilities and a ceiling mounted multi-source projector facilitate the implementation of the case study/client scenario approach. Four examples are provided that demonstrate variations of the case study/ client scenario approach: a "point in time" case study where assessment data and discussion questions are provided; a client case from admission through discharge providing the opportunity for students to discuss the outcomes of care that they have determined to be appropriate; a client case that looks at the chronicity of a health care concern over an extended period of time; and a method of cooperative learning where students groups write their own case study/client scenario.

The use of technology to implement a case study approach to learning has many benefits. These include: (1) an interactive approach - students can take an active part in their own learning and in sharing that information with classmates; (2) a critical thinking approach - students are able to analyze data to determine actions; (3) an extension of available clinical situations - instructors can supplement experiences that may not be available or practical in the clinical setting; (4) practical experience in computer use and group presentation; and (5) facilitation of group interaction.

Use of Master Classroom Technology to Implement a Case Study Approach to Learning

Introduction:

The availability of instructional technology allows for more innovative teaching strategies in the classroom. This paper describes a case study / client scenario approach used in an advanced medical/surgical nursing course as an example of interactive learning that can be facilitated by the computer technology available in a "master classroom". The "master classroom" in the Middle Tennessee State University (MTSU) Department of Nursing includes a teacher station containing a 486 PC multimedia computer, a VCR, a laser disk player, an audio receiver and speakers interfaced with a ceiling mounted multi-source projector. The room also contains six portable student stations, each with 486 PC computers. The furniture in the room was chosen to allow for movement into small student groups. By using computer technology - i.e. text, graphics, video, word processing, information access, interactive group activities can be integrated into classroom teaching strategies used in class.

Value of Case Study Learning:

Since introduced by Knowles (1980), educators have recognized the value of using adult learning theory in preparing class activities. Knowles' showed that adult learners want to be self-directed and to see the usefulness of the content they are learning. Past experiences are applied to learning activities, and adult learners enjoy active participation which has been shown to help retain what has been learned. Colgrove, et al (1995) describe the "experiential learning" approach where students take an active part in learning. Case studies provide an opportunity to incorporate these ideas, in addition to providing learning opportunities that motivate with active involvement. It provides a means for applying problem solving skills and allowing for decision making in an non-threatening, non-harmful (to the client) environment. Case studies allow students to "experience" actual client situations that may not be available or practical to provide to all students in a clinical setting. Case studies promote the development of critical thinking skills by giving the opportunity for direct exploration of data and seeing the outcome of the nursing and medical plans of care. Fostering critical thinking skills is paramount as "students who are challenged to think critically while still in the classroom setting (can)(sic) translate those skills into the clinical care setting." (Melander, 1996, p. xiii) This approach also shows that there may be multiple "correct" solutions for clinical problems. As case studies are shared in the classroom setting, the instructor provides a method for immediate feedback. Student groups can also develop cooperative learning strategies through guidelines for use in writing their own case studies. This approach fosters creative thinking and promotes group and individual responsibilities for learning and sharing knowledge with their peers.

Implementation of the Case Study Approach:

Several examples are shared below demonstrating implementation of the case study approach. The methods vary with student levels and the complexity of the class objectives.

Example 1

This case is a "point in time" approach where information about a case study / client scenario is presented along with questions that the students are instructed to answer. This is done on a individual basis or in small groups. With the multimedia capability of the teacher station, pictures, graphics or video clips are shown which allow the students to see and hear "data" concerning the client. This approach allows the students to gather and assess necessary data; to analyze that information and then to answer questions to determine the nursing plan to be implemented in the immediate care of the client. The instructor functions as a facilitator in leading a class discussion of the questions. See Appendix A for an excerpt of example 1.

Example 2

This example looks at a case study / client scenario from admission through discharge. This approach provides a sense of continuity that students may not be able to experience. Due to time constraints, students do not often have the opportunity to see the results of their care implementation. This example uses the students stations in a more interactive format. Students are divided into work groups and given the client information. They are then instructed to analyze the information at different time points in the scenario and to determine appropriate actions. Each group, using word processing on the student computers, answers questions regarding the data and plan of care for the client. Using networking capabilities, each student group's work is then projected to the ceiling-mounted projector and shared with the entire class. Following presentation, the individual group files are merged and printed to provide a hard copy for later study. See Appendix B for an excerpt of example 2.

Example 3

Example three's case study examines a client scenario over a period of years. This example allows the students to look at the chronicity of a health care concern. This implementation also combines an additional interactive technique - role playing. The scenario begins with randomly choosing three students. These students "play the role" of the client at three points in time. These students are given information about the client and the remaining students are divided into three groups. This example integrates three different aspects of nursing care - obstetrical care, home health care and acute care. Each group is instructed to interview the "client"; gather necessary information from the client's chart documentation, and plan a strategy of care. As with the example two, the finished work of each group is then presented on the ceiling-mounted projector and shared with the entire group. A hard copy is then produced for further study. See Appendix C for an excerpt of example 3.

Example 4

This example describes a cooperative learning strategy as students are instructed to develop their own case studies/case scenarios. After dividing the class into small groups, each group is instructed to review the textbook information concerning an assigned endocrine disorder. Each group then develops a client profile detailing the common characteristics that a client with that disorder would demonstrate. After describing the data appropriate to its "client", each group provides information as to the medical therapy and the nursing plan of care appropriate for the client. Again, each group presents its case to the class and a hard copy is produced for study purposes. See Appendix D for an excerpt of example 4.

Conclusion:

The use of technology to implement a case study approach to learning has many benefits. These include: (1) an interactive approach - students can take an active part in their own learning and in sharing that information with classmates; (2) a critical thinking approach - students are able to analyze data to determine actions; (3) an extension of available clinical situations - instructors can supplement experiences that may not be available or practical in the clinical setting; (4) practical experience in computer use and group presentation; and (5) facilitation of group interaction.

While a case study approach to learning can be accomplished without the availability of the "master classroom" instructional technology, its availability enhances implementation of the approach and improves the way that information is shared in the classroom setting in a timely manner.

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Appendix A
Excerpt from Case information for Example 1:

Mr. Shipp, a 72 year old retired construction worker, was admitted through the emergency room with the medical diagnosis - Acute Exacerbation of Chronic Obstructive Pulmonary Disease. Since his admission his respiratory distress has increased, his oxygenation status has worsened, and his work of breathing is rapidly leading to fatigue.
Assessment data and the medical plan is given.

Answer the following questions concerning Mr. Shipp:

1. What evidence is there is support the possibility that Mr. Shipp is developing Acute Respiratory Failure (ARF) ?
2. If you agree that he is developing ARF, what type: Ventilatory Failure, Oxygenation Failure, or a combination of both etiologies ?
3. Is intubation warranted? If so, what equipment should be available and what initial assessments should you plan to complete ?
4. Determine the highest priority nursing diagnosis appropriate for Mr. Shipp's plan of care. Be sure to complete the diagnostic statement with the explanatory related to, secondary to and defining characteristics components.
5. Develop the plan of care for the diagnosis by determining two short term outcome criteria (specific and measurable) and two nursing interventions.

Appendix B

Excerpt from Case information for Example 2 (Adapted from Lowe, A. & Melander,S.D(1996). PTCA and thrombolytic therapy in myocardial infarction. In Melander(Ed.) Review of critical care nursing: Case studies and applications (pp. 50 - 53.) Philadelphia: W.B. Saunders.

Mr. Smith, a 54 year old male, began having chest pain at work 1 hour after lunch. He described the pain as a " grabbing pressure" located midsternally. He rated the pain at "about a 4" on a scale of 1 to 10. He stated that the pain radiated down his left arm and through to his back. On admission, after transportation to the emergency department via ambulance, Mr. Smith was pale and diaphoretic and complained of shortness of breath. He denied nausea or vomiting. He was diagnosed in the ED with unstable angina, and with a myocardial infarction to be ruled out. On arrival in the ED at 12:50 p.m, he had experienced chest pain for 1 hour. The patient reported no previous episodes of chest pain or pressure. He smoked two packs of cigarettes daily for 25 years. His mother died of Alzheimer's disease and his father died of cancer. There is no family history of heart disease.

On initial examination, the patient did not exhibit jugular venous distention (JVD), the carotid pulses were 2+/4 without bruits, and point of maximum impulse (PMI) was located at the 5th ICSMCL. Normal S1 and S2 sounds were auscultated with an S4 present. No S3 sound or murmurs were heard. There were vesicular lung sounds with scattered wheezes, but no crackles were heard. No edema was present and bowel sounds were normal. Admission diagnostic data was given:

In the ED, Mr. Smith's chest pain was unrelieved after three sublingual nitroglycerin (NTG) tablets. Morphine sulfate 5 mg IVP was administered, resulting in a small decrease in pain. After evaluation of the initial laboratory results, presenting symptoms, and the EKG, the diagnosis of an extensive anterolateral myocardial infarction was made. Mr. Smith was assessed for contraindications for thrombolytic therapy. The patient was considered a candidate for the thrombolytic therapy and tissue plasminogen activator (tPa) was started immediately. The patient was then transferred to the coronary intensive care unit. In the CCU, Mr. Smith's chest pain returned at a rating of 7. After 1.5 hours of tPa, his blood pressure was 96/60 mmHg. A sublingual NTG was given, but the pain did not decrease. The EKG showed no change. Mr. Smith was sent to the catheterization laboratory for an emergency cardiac catheterization and possible percutaneous transluminal coronary angioplasty. Cardiac catheterization showed 90% blockage of the left anterior descending artery and an emergency rescue PTCA was performed.

Answer the following questions concerning Mr. Smith's case:

1. Explain the use of the medications in this scenario (Give drug classification and rationale for their use in this scenario.
5. Determine the nursing diagnosis of highest priority on admission - complete with long term goals, short term outcome criteria and appropriate interventions.
6. Determine the nursing diagnosis of highest priority following PTCA - complete with long term goals, short term outcome criteria and appropriate interventions.
7. Consider the psychosocial impact of Mr. Smith's cardiac event and list interventions that are directed toward assisting him to learn and cope with life style changes that are indicated post discharge.

Appendix C:
Excerpt from Case information for Example 3

Three students are chosen at random to role play the part of the client and the remainder of the class is divided into three groups. The following information is given. Instructions to the "Client" - Review all three stages of the client case. Be familiar with the medical history that the case presents. You may feel free to improvise with personal data as long as it does not change the outcome of the case. During the interview process, do not just read the data as given; answer the questions offered by the interviewers. If there is data that the interviewers do not ask for - you may give hints. If asked for definitive data, i.e. labs, dx tests that are not in your information, respond that that information is not available. If asked for physical assessment data that is not provided, you may improvise. Help direct the group members to focus on the outcome of the case : Part I - acute renal failure with the underlying precipitators of Lupus, post partum RBC hemolysis with the HELLP syndrome, and hypovolemia; Part II - Chronic renal failure with CAPD; Part III - Chronic Renal failure with transplantation.

Client profile Case Study Part I: You are Julie Morrow a 24 year old female with a 3 year history of Lupus erythematosus. Julie is two days post-partum following an emergency C-section. She was 34 weeks pregnant and had difficulties throughout the pregnancy with pregnancy induced hypertension. On admission, she was diagnosed with HELLP syndrome and the emergency delivery was performed. During the delivery, she became hypovolemic following massive bleeding and developed hypovolemic shock. Assessment data and the medical plan is given.

Client profile Case Study Part II: Ten years have passed; Julie Morrow is now 34 years old and has experienced declining renal function since the delivery of her child. The diagnosis of ESRD has been made and it has been determined that long term dialysis will be needed. A Tenckehoff catheter was placed and CAPD begun. You are now home and preparing to do the dialysis installation and exchange for the first time at home. A Home Health nurse is present to complete an assessment and assist you with the procedure. Assessment data and the medical plan is given.

Client profile Case Study Part III: Two years have passed; Julie Morrow is now 36 years old. She has followed the medical plan with the common problems and has been waiting for a renal transplant. She wears a beeper and remains in contact with the transplant procurement team. Last night she was called and told that a compatible kidney had been found and she was chosen as its recipient. She went immediately to the hospital and has undergone transplantation. She has now entered the SICU following the surgery. Assessment data and the medical plan is given.

Appendix D:
Excerpt of Case Information for Example 4 :

After dividing the class into six groups, randomly assign the following endocrine disorders: Diabetes Insipidus, Syndrome of Inappropriate ADH, Thyrotoxicosis, Myedema Coma, Diabetes Mellitus in Ketoacidosis, and Hyperglycemic Hyperosmolar, Non-ketotic Coma. Instruct each group to develop a client profile and case study detailing a client history (include the underlying pathology, etiology of the current state, assessments that would be expected), client profile (current assessment, lab data, diagnostic information), and the highest priorities in the immediate nursing plan of care. Following development of each case study / client scenario, each group will present its case to the class. Following presentations a hard copy will be produced for all class members.